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EXAMINER	
AGUSTIN, PETER VINCENT	

ART UNIT	PAPER NUMBER
2652	

DATE MAILED: 03/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/989,414	PARK, SANG ON
	Examiner	Art Unit
	Peter Vincent Agustin	2652

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 November 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) *13-20* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 November 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: METHOD AND APPARATUS FOR CALCULATING A VARIATION PER TRACK OF A FOCUS ERROR TO CONTROL THE TILT OF A DISK.

Claim Objections

2. The following claim objection to which the Applicant has not responded has been addressed by the Examiner on the Office Action mailed May 21, 2004.

3. Claims 1-9 are objected to because claim 1, lines 2-3 recite "for maximizing an RF signal or minimizing jitter" which should be --where an RF signal is maximum or jitter is minimum--. Note that the applicant's disclosure does not provide support for the claimed step of "detecting a track of a focus error for maximizing an RF signal or minimizing jitter". However, it does provide support for "detecting a track of a focus error where an RF signal is maximum or jitter is minimum".

Claims 2-9 are dependent upon claim 1.

4. Claim 11 is objected to because on line 8, the phrase "and an optical disk" is grammatically confusing.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 2, 3, 5-9, 11 & 12 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 2 recites the step of calculating a variation per track of the maximum value and the minimum value of the focus error to detect a normalized DC component. The Examiner acknowledges that page 11, lines 8-12 of the specification mentions detecting "the DC component" using the maximum or minimum of the peak-to-peak values of the FE or both, but nowhere in the specification does the applicant describe how a normalized DC component (or simply a DC component) is calculated using a variation per track of the maximum value and the minimum value of the focus error.

Claim 5 recites the step of normalizing the variation per track of the focus error and the surface vibration to control the tilt. The Examiner acknowledges that page 13, lines 7-12 of the specification mentions normalizing the FE by inducting FE AC variation, but nowhere in the specification does the applicant describe "normalizing the variation per track of the focus error and the surface vibration to control the tilt".

Claim 11, lines 5-8 recite "a tilt error detecting and controlling block for receiving RF and focus error signals.....to produce DC and AC values about the tilt initialization", which recitation is not enabled. The specification discloses obtaining a DC value from an FE signal. However, the specification does not disclose: obtaining an AC value from an FE signal (note that the claimed AC value results from a detected vibration); obtaining a DC value from an RF signal; and obtaining an AC value from an RF signal.

Claims 3, 6-9 & 12 are dependent upon rejected base claims.

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 1-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1, line 2 recites "a track of a focus error", which is indefinite because it is unclear what the applicant intends to describe as a "track" of a focus error.

Claim 5 recites "normalizing the variation per track of the focus error and the surface vibration to control the tilt", which recitation has not been properly defined or described in the specification, rendering it indefinite (see 112-1st paragraph rejection above). For examination purposes, this recitation is interpreted as "using the variation per track of the focus error and the surface vibration to control the tilt". Similarly, claims 6, 8 & 9 recite "a normalized value", which is indefinite, and hereafter will be interpreted simply as "a value".

Claims 7 & 10 recite "FE track", which recitation is unclear for the same reasons as claim 1 above.

Claim 10 recites "wobbling a tilt driving block", which is unclear because the term "wobbling" has not been clearly defined or described in the specification. For examining purposes, "wobbling" will be interpreted as "moving with an uneven or rocking motion or unsteadily from side to side" or "oscillating", as defined in the dictionary.

Claims 2-9 are dependent upon claim 1.

9. Claims 1-10 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01.

Claim 1 recites a step of detecting the maximum value and the minimum value of the focus error, but does not describe how this step is cooperatively related to the other steps in order to achieve tilt control.

Claims 8 & 9 recite, respectively, "a normalized value is proportional to time in a case of constant linear velocity" and "a normalized value is proportional to length in a case of constant angular velocity", but do not recite how these limitations are cooperatively related to the previous claims.

Claim 10 recites steps of wobbling a tilt driving block, obtaining an FE track, and normalizing the FE track, but does not describe how these steps are cooperatively related in order to achieve tilt control.

Claims 2-9 are dependent upon claim 1.

10. The following art rejections are made in light of the 112-2nd paragraph rejections.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tamaru et al. (US 5,107,478) in view of Yamakawa et al. (US 5,682,372).

In regard to claim 1, Tamaru et al. disclose a tilt controlling method comprising the steps of: detecting a track of a focus error when a focus is on (column 5, lines 46-53: note "servo system" and "focus drive"); and calculating a variation per track of the focus error to control the tilt using the variation (see also patent claim 3, where a detection means produces a detection signal based on a focus drive DC voltage, and a servo means controls a tilt means in response to the detection signal). However, in regard to claim 1, Tamaru et al. do not disclose: detecting a track of a focus error "for maximizing an RF signal or minimizing a jitter" (interpreted as "where an RF signal is maximum or jitter is minimum", see claim objection above); and detecting the maximum value and the minimum value of the focus error.

Yamakawa et al. disclose applying focus servo at a point where an RF signal is maximum or jitter is minimum (column 3, lines 44-47); and setting a focus-balance coefficient K such that an RF signal is maximized or jitter is minimized (column 5, lines 25-38); and detecting the maximum value and the minimum value of a focus error (column 8, lines 36-41: "the positive peak and the negative peak of the focus error voltage").

It would have been obvious to one of ordinary skill in the art at the time of the invention by the applicant to have detected the track of the focus error of Tamaru et al. where an RF signal is maximum or jitter is minimum as suggested by Yamakawa et al.; and to have detected the maximum value and the minimum value of the focus error of Tamaru et al. as suggested by Yamakawa et al, the motivation being to obtain optimum focus, thereby optimizing reading from the optical disk (see column 5, lines 10-12) (see also Takamine et al. (US 6,240,055), column 42, line 57 thru column 43, line 17, which teach that the best focus position is obtained where an RF signal is maximum or jitter is minimum).

In regard to claim 2, Tamaru et al. disclose the step of calculating a variation per track of the maximum value and the minimum value of the focus error (column 5, lines 46-53: "focus drive") to detect a normalized DC component. Note that the focus drive signal inherently has a maximum value and a minimum value, and the focus drive signal as a whole produces a "focus drive DC voltage", i.e., the claimed "variation per track of the maximum value and the minimum value" and the claimed "normalized DC component".

In regard to claim 3, Tamaru et al. disclose (column 5, lines 46-61) that a tilt reference ("the distance between the optical disc D and the optical pickup 25" of lines 47-48) is varied as much as the variation per track to control the tilt (lines 58-60: note "so that the value of the focus drive DC voltage.....will become equal to a reference voltage"; and also column 6, lines 8-12: "the servo system 40 supplies a control voltage based on the difference between the focus drive DC voltage and a reference voltage to the tilt drive motor 30 to perform the servo control"; and patent claim 3: "responsive to the detection signal for controlling the tilt means to maintain the distance between the optical pickup and the optical disc constant").

In regard to claim 4, Tamaru et al. disclose the step of detecting a DC component using the maximum value and the minimum value of the focus error (column 5, lines 46-53: "focus drive") to control the tilt, wherein the maximum value and the minimum value of the focus error can be applied separately or at the same time. See Note for claim 2 above. The "focus drive DC voltage" is considered as a whole for tilt control, i.e., the claimed "can be applied at the same time". Note that the claimed "can be applied separately" is in the alternative form, and therefore does not need to be met by the reference.

13. Claims 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tamaru et al. & Yamakawa et al. as applied to claim 1 above, and further in view of Baba (US 5,808,984).

For a description of Tamaru et al. & Yamakawa et al., see the rejections above. Furthermore, in regard to claim 5, Tamaru et al. & Yamakawa et al. disclose the steps of calculating the variation per track of the focus error (see claim 1 above), and normalizing the variation per track of the focus error (interpreted as "using the variation per track of the focus error") to control the tilt (see claim 1 above). However, in regard to claim 5, Tamaru et al. & Yamakawa et al. do not disclose the steps of detecting a surface vibration from the trembling of a disk; and normalizing the surface vibration to control the tilt.

Baba discloses detecting a vibration of an actuator and using this vibration to detect tilt (column 9, lines 8-12). It would have been obvious to one of ordinary skill in the art at the time of the invention by the applicant to have detected the tilt of Tamaru et al. & Yamakawa et al. using a vibration of an actuator as suggested by Baba, the motivation being to perform recording and reproduction with high reliability (column 1, lines 59-65).

It is noted that while Baba discloses detecting a vibration of an actuator to detect tilt, Baba does not disclose "controlling" the tilt, i.e., compensating the tilt in response to the detection result. However, as discussed above, Tamaru et al. & Yamakawa et al. disclose this missing feature; therefore, the claimed "normalizing vibration to control the tilt" (interpreted as "using vibration to control the tilt") would be the inherent result of the noted combination of references.

Baba discloses that the vibration results from the actuator. Baba does not disclose that the vibration results from the "trembling of a disk" as required by claim 5. Therefore, Tamaru et al.

& Yamakawa et al. in further view of Baba do not disclose the claimed "detecting a surface vibration from trembling of a disk". However, it would have been obvious to one of ordinary skill in the art at the time of the invention by the applicant to have detected the vibration of Tamaru et al., Yamakawa et al., and Baba from trembling of a disk because the applicant has not disclosed that detecting a surface vibration from trembling of a disk provides an advantage, is used for a particular purpose, or solves a stated problem, and one of ordinary skill in the art would have expected the applicant's invention to perform equally well with either the claimed detecting a surface vibration from trembling of a disk or detecting vibration of the actuator as taught by Tamaru et al., Yamakawa et al., and Baba, because both techniques perform the same function of detecting/controlling tilt (see for example Matsubayashi et al. (US 4,631,712), column 1, lines 27-30, which teach that tilt may be caused by vibration of an optical disk).

In regard to claim 6, Tamaru et al. disclose that a normalized value (column 5, line 54: "focus drive DC voltage") and a reference value ("the distance between the optical disc D and the optical pickup 25" of column 5, lines 47-48) due to tilt initialization are considered to control the tilt.

In regard to claim 7, Tamaru et al. does not disclose that the reference value due to tilt initialization is obtained from an FE track at a point where an RF envelope peak has the maximum value or a jitter has the minimum value.

Yamakawa et al. disclose applying focus servo at a point where an RF envelope peak has the maximum value or a jitter has the minimum value (column 3, lines 44-47). It would have obtained the reference value due to tilt initialization of Tamaru et al. at a point where an RF envelope peak has the maximum value or a jitter has the minimum value as suggested by

Yamakawa et al., the motivation being to obtain optimum focus, thereby optimizing reading from the optical disk (see column 5, lines 10-12) (see also Takamine et al. (US 6,240,055), column 42, line 57 thru column 43, line 17, which teach that the best focus position is obtained where an RF signal is maximum or jitter is minimum).

14. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tamaru et al., Yamakawa et al., and Baba as applied to claim 5 above, and further in view of Jobs (US 6,215,747).

For a description of Tamaru et al., Yamakawa et al., and Baba, see the rejection above. However, in regard to claim 8, Tamaru et al., Yamakawa et al., and Baba do not disclose that a normalized value is proportional to time in a case of constant linear velocity.

Jobs discloses (as best interpreted by the examiner in light of the 112-2nd paragraph rejections above) (please refer to column 3, lines 19-25) a normalized value ("location of a data file" of line 23) proportional to time (line 22) in a case of constant linear velocity (line 22). It would have been obvious to one of ordinary skill in the art at the time of the invention by the applicant to have provided a normalized value proportional to time in a case of constant linear velocity to the method of Tamaru et al., Yamakawa et al., and Baba, as suggested by Jobs, the motivation being to optimize access times of different regions of a disk (well known advantage of the teachings in column 3, lines 26-33).

15. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tamaru et al., Yamakawa et al., and Baba as applied to claim 5 above, and further in view of Van Den Enden (US 6,452,897).

For a description of Tamaru et al., Yamakawa et al., and Baba, see the rejection above. However, in regard to claim 9, Tamaru et al., Yamakawa et al., and Baba do not disclose that a normalized value is proportional to length in a case of constant linear velocity.

Van Den Enden discloses (as best interpreted by the examiner in light of the 112-2nd paragraph rejections above) (please refer to column 3, lines 62-66) a normalized value ("the radial position" of line 65) is proportional to length (line 64) in a case of constant angular velocity (line 63). It would have been obvious to one of ordinary skill in the art at the time of the invention by the applicant to have provided a normalized value proportional to length in a case of constant angular velocity to the method of Tamaru et al., Yamakawa et al., and Baba, as suggested by Van Den Enden, the motivation being to enable a more reliable and less complex detection of headers in an optical disc (column 2, lines 6-8).

16. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kamiya et al. (US 5,001,690) in view of Yamakawa et al., and further in view of Smid et al. (US 4,712,205).

In regard to claim 10, Kamiya et al. disclose a tilt controlling method (see title) comprising the step of: wobbling a tilt driving block (figure 1, element 48 & 50) at a certain frequency (also note column 4, lines 3-27, which describe periodically judging whether an RF level has increased or decreased; determining the driving direction of tilt control at each judgment; and periodically performing tilt driving in either direction, i.e., the claimed "wobbling"; also note the signals on Figure 15). However, in regard to claim 10, Kamiya et al. do not disclose the steps of: obtaining an FE track at a point where a RF signal has the maximum value; and normalizing the detected FE track.

Yamakawa et al. disclose obtaining an FE track at a point where a RF signal has the maximum value (column 3, lines 44-47). It would have been obvious to one of ordinary skill in the art at the time of the invention by the applicant to have added the step of obtaining an FE track at a point where a RF signal has the maximum value taught by Yamakawa et al. to the method of Kamiya et al., the motivation being to obtain optimum focus, thereby optimizing reading from the optical disk (see column 5, lines 10-12) (see also Takamine et al. (US 6,240,055), column 42, line 57 thru column 43, line 17, which teach that the best focus position is obtained where an RF signal is maximum or jitter is minimum).

Kamiya et al. in view of Yamakawa et al. do not disclose the step of normalizing the detected FE track.

Smid et al. disclose normalizing a focus error signal (column 4, line 66 thru column 5, line 6). It would have been obvious to one of ordinary skill in the art at the time of the invention by the applicant to have added the normalizing step of Smid et al. to the method of Kamiya et al. and Yamakawa et al., the motivation being to prevent undesired effects of contamination of optical elements and influence of tracking errors.

17. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takamine et al. (US 5,805,543) in view of Suzuki (JP 01307933 A).

In regard to claim 11, Takamine et al. disclose a tilt controlling apparatus (Figure 16) of an optical record medium (1), comprising: a RF and servo error producing unit (inherent: note output RF and column 7, lines 23-27, which state that the light receiving element outputs RF and servo signals) for producing RF and servo error signals from an electric signal outputted from an optical pickup unit (2); a servo controlling unit (7, 8, 4, 5, 6B, 12 & 90) having a tilt error

detecting and controlling block to produce DC and AC values (TLE, see also Figure 17A, and column 16, lines 56-61, which state that signal TLE is an AC tilt component superimposed on a DC tilt servo component) about the tilt initialization and an optical disk; and a servo driving unit (10) for controlling said optical pick-up unit in response to a signal of said servo controlling unit. Furthermore, in regard to claim 11, Takamine et al. disclose that the tilt error detecting and controlling block receives an RF signal (output of element 2). However, in regard to claim 11, Takamine et al. do not disclose that the tilt error detecting and controlling block receives focus error signals outputted from said RF and servo error producing unit to produce the DC values about the tilt initialization.

Suzuki discloses receiving a focus signal to produce DC values about tilt initialization (see purpose and first three lines of constitution). It would have been obvious to one of ordinary skill in the art at the time of the invention by the applicant to have received the focus error signal of Takamine et al. to produce DC values about tilt initialization as suggested by Suzuki, the motivation being to obtain a reproducing signal of high accuracy without being influenced by a surface state of an optical disk.

18. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takamine et al. & Suzuki as applied to claim 11 above, and further in view of Yamakawa et al.

For a decription of Takamine et al. & Suzuki, see the rejection above. Furthermore, in regard to claim 12, Takamine et al. and Suzuki disclose that said tilt error detecting and controlling block includes a tilt controlling block for controlling the tilt using the RF signal and an FE signal (see claim 11 above; note that this would be an inherent result of the above noted combination). However, in regard to claim 12, Takamine et al. and Suzuki do not disclose that

said tilt error detecting and controlling block includes a RF peak detecting block for detecting the peak of an RF envelope; and a detecting block for detecting the maximum and minimum values of a focus error per one rotation of a disk.

Yamakawa et al. disclose a RF peak detecting block (inherent from column 3, lines 44-47) for detecting the peak of an RF envelope; and a detecting block (inherent from column 8, lines 36-41) for detecting the maximum and minimum values of a focus error. It would have been obvious to one of ordinary skill in the art at the time of the invention by the applicant to have added the RF peak detecting block and the detecting block of Yamakawa et al. to the tilt error detecting and controlling block of Takamine et al. and Suzuki, the motivation being to obtain optimum focus, thereby optimizing reading from the optical disk (see column 5, lines 10-12) (see also Takamine et al. (US 6,240,055), column 42, line 57 thru column 43, line 17, which teach that the best focus position is obtained where an RF signal is maximum or jitter is minimum).

Takamine et al. and Suzuki in further view of Yamakawa et al. are silent to whether the maximum and minimum value of the focus error are detected "per one rotation" of a disk. However, it would have been obvious to one of ordinary skill in the art at the time of the invention by the applicant to have detected the maximum and minimum value of the focus error of Takamine et al., Suzuki, and Yamakawa et al. per one rotation of a disk because the applicant has not disclosed that this limitation provides an advantage, is used for a particular purpose, or solves a stated problem, and one of ordinary skill in the art would have expected the applicant's invention to perform equally well with either detecting the maximum and minimum value of the focus error taught by Takamine et al., Suzuki, and Yamakawa et al. or the claimed detecting the

maximum and minimum value of the focus error "per one rotation" of a disk, and adding this limitation would have been an obvious matter of design choice.

Response to Arguments

19. Applicant's arguments filed November 19, 2004 have been fully considered. The previous rejections have been withdrawn; therefore, the arguments are moot. However, upon further consideration, new grounds of rejections have been made.

Conclusion

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter Vincent Agustin whose telephone number is 703-305-8980. The examiner can normally be reached on Monday-Friday 9:30-5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa Thi Nguyen can be reached on 703-305-9687. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Peter Vincent Agustin
Art Unit 2652

DAVID DAVIS
PRIMARY EXAMINER